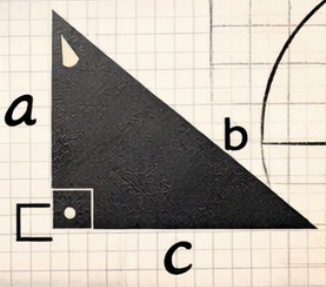
Karri Srinivasa Anantha Chaitanya

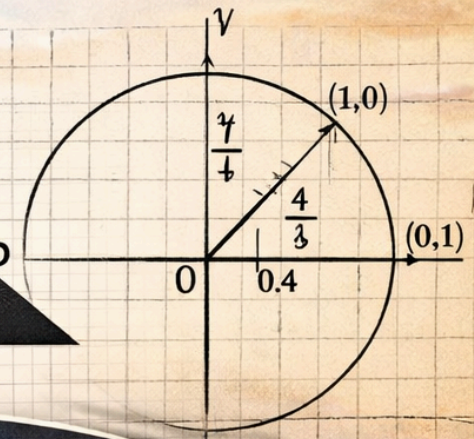
"In Trigonometry, every angle has a story to tell..."

$$\sin\theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\cos\theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\tan\theta = \frac{\text{Opposite}}{\text{Adjacent}}$$



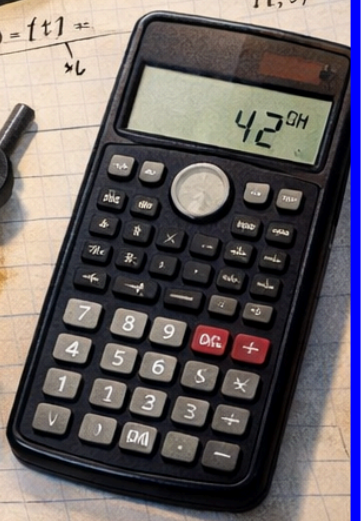


The Art of Trigonometry

(Exclusively for Class 10th)

$1+\tan^2\theta = \sec^2\theta$

$\theta = 45°$



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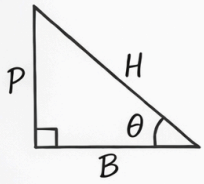
Trigonometric Ratios & Identities



Trigonometric Ratios

$$\sin\theta = \frac{P}{H}$$

$$\cos\theta = \frac{B}{H}$$

$$\tan\theta = \frac{P}{B}$$

$$\csc\theta = \frac{H}{P}$$

$$\sec\theta = \frac{H}{B}$$

$$\cot\theta = \frac{B}{P}$$

Reciprocal Identities :

$$\csc\theta = \frac{1}{\sin\theta}$$

$$\sec\theta = \frac{1}{\cos\theta}$$

$$\cot\theta = \frac{1}{\tan\theta}$$

Quotient Identities :

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

$$\cot\theta = \frac{\cos\theta}{\sin\theta}$$

Pythagorean Identities :

$$\sin^2\theta + \cos^2\theta = 1$$

$$1 + \tan^2\theta = \sec^2\theta$$

$$1 + \cot^2\theta = \csc^2\theta$$

① If $\tan A + \cot A = 2$, then $\tan^2 A + \cot^2 A = 2$.

(A) Given:- $\tan A + \cot A = 2$.

from given expansion
(Squaring on both sides)

$$(\tan A + \cot A)^2 = 2^2$$

$$\Rightarrow (\tan A + \cot A)^2 = 4$$

$$\Rightarrow \tan^2 A + \cot^2 A + 2 \tan A \cdot \cot A = 4$$

[Important : $\tan A \cdot \cot A = 1$]

$$\Rightarrow \tan A \cdot \frac{1}{\tan A} \Rightarrow 1$$

$$\Rightarrow \tan^2 A + \cot^2 A + 2(1) = 4$$

$$\Rightarrow \tan^2 A + \cot^2 A + 2 = 4$$

$$\tan^2 A + \cot^2 A = 2$$

$\boxed{\tan^2 A + \cot^2 A = 2}$, Hence proved

Important Identities

- $\tan A \cdot \cot A = 1$
- $\sin^2\theta + \cos^2\theta = 1$
- $\sec^2\theta = 1 + \tan^2\theta$
- $\operatorname{cosec}^2\theta = 1 + \cot^2\theta$

2) Prove:- $\sqrt{\sec^2\theta + \operatorname{cosec}^2\theta} = \tan\theta + \cot\theta$

A) LHS:-

$\sqrt{\sec^2\theta + \operatorname{cosec}^2\theta}$

$\Rightarrow \sqrt{1+\tan^2\theta + 1 + \cot^2\theta}$ $\quad \left[2\tan\theta \cdot \cot\theta \;\; 2\tan\theta \cdot \frac{1}{\tan\theta} \Rightarrow 2\right]$

$\Rightarrow \sqrt{\tan^2\theta + \cot^2\theta + 2}$

$\Rightarrow \sqrt{(\tan\theta + \cot\theta)^2}$

$\Rightarrow \boxed{\tan\theta + \cot\theta}$ LHS = RHS

---

3) Prove:-

$(1+\tan\theta - \sec\theta)(1+\tan\theta + \sec\theta) = 2\tan\theta$

A) LHS:-

$\Rightarrow (1+\tan\theta - \sec\theta)(1+\tan\theta + \sec\theta)$

$\Rightarrow (1+\tan\theta)^2 - \sec^2\theta \rightarrow \left[(a+b)(a-b) = a^2 - b^2\right]$

$\Rightarrow 1 + \tan^2\theta + 2\tan\theta - \sec^2\theta$

$\Rightarrow \sec^2\theta - \sec^2\theta + 2\tan\theta$

$\Rightarrow \boxed{2\tan\theta}$ LHS = RHS

4) $\sin\theta + \cos\theta = \sqrt{2}\cos\theta$, value of $\tan\theta$

A) $\sin\theta + \cos\theta = \sqrt{2}\cos\theta$

Divide LHS, RHS by $\cos\theta$

$\Rightarrow \frac{\sin\theta + \cos\theta}{\cos\theta} = \frac{\sqrt{2}\cos\theta}{\cos\theta}$

$\Rightarrow \frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\cos\theta} = \sqrt{2}\frac{\cos\theta}{\cos\theta}$

$\Rightarrow \tan\theta + 1 = \sqrt{2}$

$\Rightarrow \boxed{\tan\theta = \sqrt{2} - 1}$

5)

prove :- $\frac{1+\sec\theta}{\sec\theta} = \frac{\sin^2\theta}{1-\cos\theta}$

LHS :- $\frac{1+\sec\theta}{\sec\theta} \Rightarrow \frac{1}{\sec\theta} + \frac{\sec\theta}{\sec\theta}$

$\Rightarrow \boxed{\cos\theta + 1}$

RHS :- $\frac{\sin^2\theta}{1-\cos\theta} \Rightarrow \frac{1-\cos^2\theta}{1-\cos\theta} \Rightarrow \frac{(1+\cos\theta)(1-\cos\theta)}{1-\cos\theta}$

$\Rightarrow \boxed{1+\cos\theta}$, LHS = RHS

6)

) $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = 0$ (show)

) LHS:-

$2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1$

Important :-

$$a^3+b^3 = (a+b)^3 - 3ab(a+b)$$

$$a^2+b^2 = (a+b)^2 - 2ab$$

) $\sin^6\theta + \cos^6\theta \Rightarrow (\sin^2\theta)^3 + (\cos^2\theta)^3$

$\Rightarrow (\sin^2\theta + \cos^2\theta)^3 - 3\sin^2\theta\cos^2\theta(\sin^2\theta + \cos^2\theta)$

$\Rightarrow (1)^3 - 3\sin^2\theta\cos^2\theta(1)$

$\Rightarrow 1 - 3\sin^2\theta\cos^2\theta$

) $\sin^4\theta + \cos^4\theta \Rightarrow (\sin^2\theta)^2 + (\cos^2\theta)^2$

$\Rightarrow (\sin^2\theta + \cos^2\theta)^2 - 2\sin^2\theta\cos^2\theta$

$\Rightarrow 1 - 2\sin^2\theta\cos^2\theta$

) $2(1 - 3\sin^2\theta\cos^2\theta) - 3(1 - 2\sin^2\theta\cos^2\theta) + 1$

) $2 - 6\sin^2\theta\cos^2\theta - 3 + 6\sin^2\theta\cos^2\theta + 1$

) $2 - 3 + 1 \Rightarrow -1 + 1 = \boxed{0}$, LHS = RHS

7)

$$\frac{(1+\cot\theta+\tan\theta)(\sin\theta-\cos\theta)}{\sec^3\theta-\operatorname{cosec}^3\theta} = \sin^2\theta\cos^2\theta$$

A) LHS:-

$$\frac{\left(1+\frac{\cos\theta}{\sin\theta}+\frac{\sin\theta}{\cos\theta}\right)(\sin\theta-\cos\theta)}{\frac{1}{\cos^3\theta}-\frac{1}{\sin^3\theta}}$$

$$\Rightarrow \frac{\left(\frac{\sin\theta\cos\theta+\sin^2\theta+\cos^2\theta}{\sin\theta\cos\theta}\right)(\sin\theta-\cos\theta)}{\frac{\sin^3\theta-\cos^3\theta}{(\sin\theta\cos\theta)^3}}$$

$$\Rightarrow \frac{(\sin\theta\cos\theta+\sin^2\theta+\cos^2\theta)(\sin\theta-\cos\theta)}{\frac{\sin^3\theta-\cos^3\theta}{(\sin\theta\cos\theta)^2}}$$

$$\Rightarrow \sin^2\theta\cos^2\theta\left[\frac{\sin\theta\cos\theta+\sin^2\theta+\cos^2\theta(\sin\theta-\cos\theta)}{\sin^3\theta-\cos^3\theta}\right]$$

$$\boxed{a^3-b^3=(a-b)(a^2+ab+b^2)}$$

$$\Rightarrow \sin^2\theta\cos^2\theta\left[\frac{\sin^3\theta-\cos^3\theta}{\sin^3\theta-\cos^3\theta}\right] \Rightarrow \sin^2\theta\cos^2\theta, \text{ LHS} = \text{RHS}$$

8)

) $a\cos^3\theta = x$, $b\sin^3\theta = y$

Prove :- $\left(\frac{x}{a}\right)^{\frac{2}{3}} + \left(\frac{y}{b}\right)^{\frac{2}{3}} = 1$

LHS :-

$\left(\frac{x}{a}\right)^{\frac{2}{3}} + \left(\frac{y}{b}\right)^{\frac{2}{3}} \Rightarrow \left(\frac{a\cos^3\theta}{a}\right)^{\frac{2}{3}} + \left(\frac{b\sin^3\theta}{b}\right)^{\frac{2}{3}}$

$\Rightarrow (\cos^3\theta)^{\frac{2}{3}} + (\sin^3\theta)^{\frac{2}{3}}$

[always remember $(a^3)^{\frac{2}{3}} = a^2$]

$\Rightarrow (\cos^3\theta)^{\frac{2}{3}} + (\sin^3\theta)^{\frac{2}{3}}$

$\Rightarrow \cos^2\theta + \sin^2\theta \Rightarrow (1)$ LHS = RHS

9)

$\tan\theta + \sin\theta = m$, $\tan\theta - \sin\theta = n$, show :- $m^2 - n^2 = 4\sqrt{mn}$

) $\tan\theta + \sin\theta = m$, $\tan\theta - \sin\theta = n$

$\Rightarrow m^2 - n^2$

$\Rightarrow (\tan\theta + \sin\theta)^2 - (\tan\theta - \sin\theta)^2$

$\Rightarrow \tan^2\theta + \sin^2\theta + 2\sin\theta\tan\theta - (\tan^2\theta + \sin^2\theta - 2\sin\theta\tan\theta)$

$\Rightarrow \tan^2\theta + \sin^2\theta + 2\sin\theta\tan\theta - \tan^2\theta - \sin^2\theta + 2\sin\theta\tan\theta$

$\Rightarrow \boxed{4\sin\theta\tan\theta}$

RHS :- $4\sqrt{mn}$

$\Rightarrow 4\sqrt{(\tan A + \sin A)(\tan A - \sin A)}$

$\Rightarrow 4\sqrt{\tan^2 A - \sin^2 A}$

$\Rightarrow 4\sqrt{\frac{\sin^2 A}{\cos^2 A} - \sin^2 A}$

$\Rightarrow 4\sqrt{\frac{\sin^2 A - \sin^2 A \cos^2 A}{\cos^2 A}} \Rightarrow 4\sqrt{\frac{\sin^2 A (1 - \cos^2 A)}{\cos^2 A}}$

$\Rightarrow 4\sqrt{\frac{\sin^2 A \cdot \sin^2 A}{\cos^2 A}} \Rightarrow 4\frac{\sin A}{\cos A} \cdot \sin A \Rightarrow \boxed{4\sin A \tan A}$

LHS = RHS

10)

$$\frac{\cot A + \tan B}{\cot B + \tan A} = \cot A \tan B \text{ (prove)}$$

LHS:- $\dfrac{\cot A + \tan B}{\cot B + \tan A} \Rightarrow \dfrac{\frac{\sin B}{\cos B} + \frac{\cos A}{\sin A}}{\frac{\cos B}{\sin B} + \frac{\sin A}{\cos A}}$

$\Rightarrow \dfrac{\frac{\sin A \sin B + \cos A \cos B}{\sin A \cos B}}{\frac{\cos A \cos B + \sin A \sin B}{\cos A \sin B}} \Rightarrow \dfrac{\sin A \sin B + \cos A \cos B}{\sin A \cos B} \times \dfrac{\cos A \sin B}{\cos A \cos B + \sin A \sin B}$

$\Rightarrow \dfrac{\cos A \sin B}{\sin A \cos B} \Rightarrow \dfrac{\cos A}{\sin A} \times \dfrac{\sin B}{\cos B} = \boxed{\cot A \tan B}$

11)

$(\sin\theta + \operatorname{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$

LHS:-

$\Rightarrow \sin^2\theta + \operatorname{cosec}^2\theta + \cos^2\theta + \sec^2\theta + 2\sin\theta\operatorname{cosec}\theta + 2\cos\theta\sec\theta$

$\Rightarrow \sin^2\theta + \cos^2\theta + \sec^2\theta + \operatorname{cosec}^2\theta + 2\sin\theta \cdot \frac{1}{\sin\theta} + 2\cos\theta \cdot \frac{1}{\cos\theta}$

$\Rightarrow 1 + (1 + \tan^2\theta) + (1 + \cot^2\theta) + 2 + 2$

$\Rightarrow 1 + 1 + \tan^2\theta + 1 + \cot^2\theta + 4$

$\Rightarrow \boxed{7 + \tan^2\theta + \cot^2\theta}$ LHS = RHS, Hence proved

12)

) $\sqrt{3}\sin\theta - \cos\theta = 0$ find value of 'θ'

) $\sqrt{3}\sin\theta - \cos\theta = 0$

$\sqrt{3}\sin\theta = \cos\theta$

"Divide by $\cos\theta$"

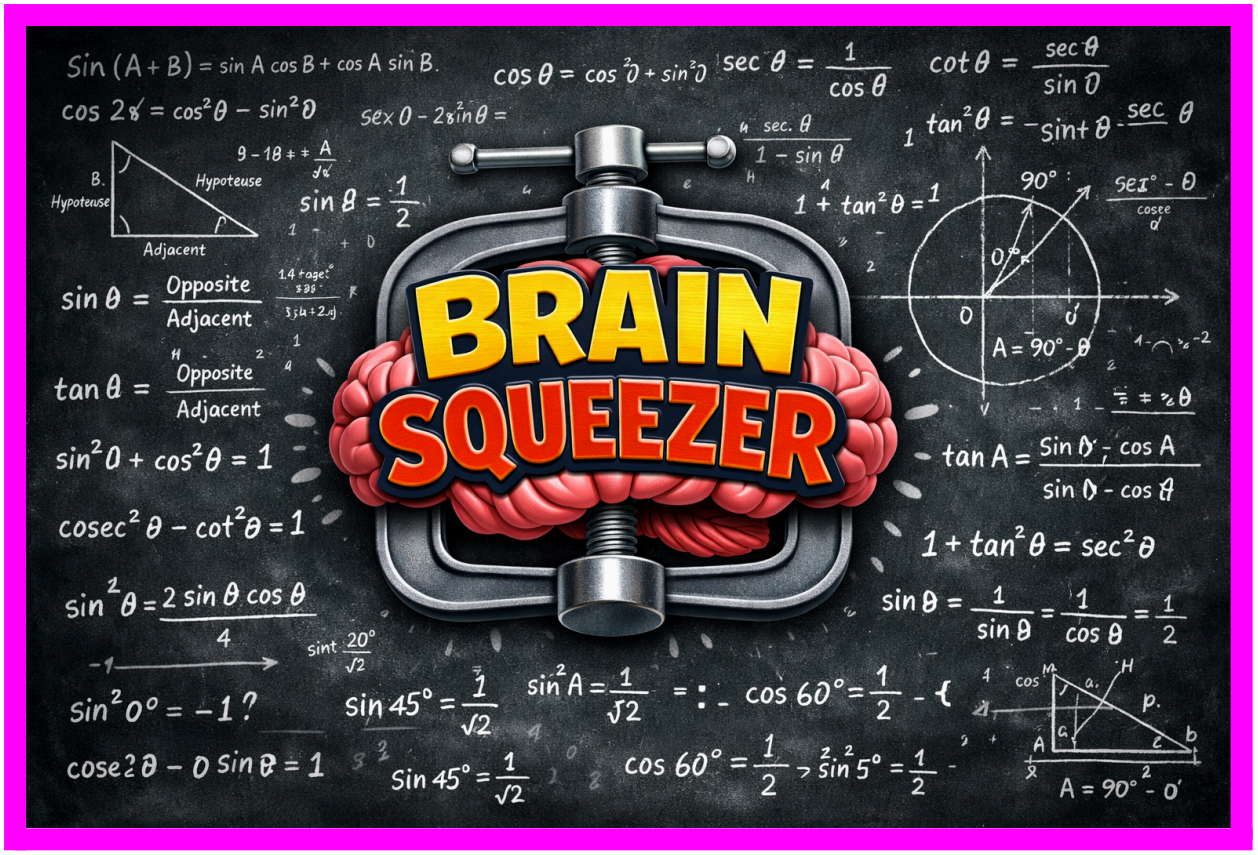
$\Rightarrow \frac{\sqrt{3}\sin\theta}{\cos\theta} = \frac{\cos\theta}{\cos\theta}$

$\Rightarrow \sqrt{3}\tan\theta = 1$

$\Rightarrow \tan\theta = \frac{1}{\sqrt{3}}$

$\Rightarrow \tan\theta = \tan 30^\circ$

$\boxed{\theta = 30^\circ}$


BRAIN
SQUEEZER
Sin (A + B) = sin A cos B + cos A sin B.
cos θ = cos²θ + sin²θ
sec θ = 1/cos θ
cot θ = sec θ / sin θ
cos 2θ = cos²θ − sin²θ
sin θ = 1/2
sin θ = Opposite / Adjacent
tan θ = Opposite / Adjacent
sin²θ + cos²θ = 1
cosec²θ − cot²θ = 1
sin²θ = 2 sin θ cos θ / 4
sin²0° = −1 ?
cose2θ − 0 sin θ = 1
sin 45° = 1/√2
sin²A = 1/√2
cos 60° = 1/2
1 + tan²θ = sec²θ
sin θ = 1/sin θ = 1/cos θ = 1/2
A = 90° − θ
tan A = Sin θ − cos A / sin θ − cos θ
1 + tan²θ = sec²θ
A = 90° − θ

1) Find the exact value of:-

$\sin 15^\circ \cos 75^\circ + \cos 15^\circ \sin 75^\circ$

2) If $\sin\theta = \cos(90^\circ - \theta)$

Prove that θ can take infinitely many values, and list any Three such values

3) prove that

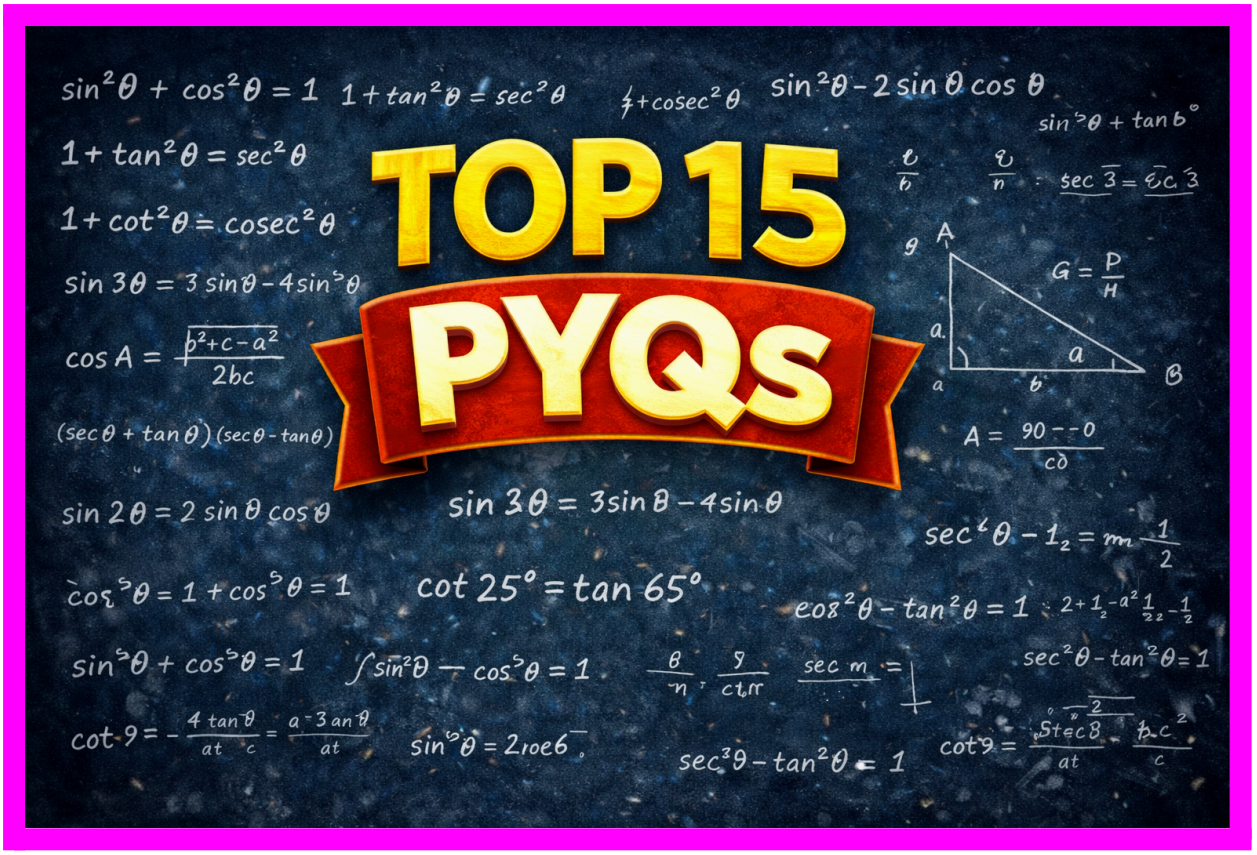
$$\frac{\sin^4\theta + \cos^4\theta}{\sin^2\theta + \cos^2\theta} = 1 - 2\sin^2\theta\cos^2\theta$$

4) If $\sin\theta : \cos\theta = (x+1) : (x-1)$

find value of $\sec\theta - \operatorname{cosec}\theta$ in terms of x

5) prove that :-

$$\frac{1}{\sin\theta - \cos\theta} + \frac{1}{\sin\theta + \cos\theta} = \frac{2\sin\theta}{\sin^2\theta - \cos^2\theta}$$


TOP 15
PYQs

1) If $\tan A + \cot A = 6$, find the value of

$\tan^2 A + \cot^2 A - 4$

2) If $\alpha + \beta = 90°$ and $\alpha = 2\beta$, then $\cos^2\alpha + \sin^2\beta$ is equal to

3) Evaluate: $\dfrac{\tan^2 60°}{\sin^2 60° + \cos^2 30°}$

4) $\dfrac{\cos\theta}{\sqrt{1-\cos^2\theta}}$ is equal to

5) Prove that

$$\sqrt{\frac{\sec A - 1}{\sec A + 1}} + \sqrt{\frac{\sec A + 1}{\sec A - 1}} = 2\operatorname{cosec} A$$

6) Prove that :-

$$\frac{\cos\theta - 2\cos^3\theta}{\sin\theta - 2\sin^3\theta} + \cot\theta = 0$$

7) Prove that :-

$$\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \sec\theta \operatorname{cosec}\theta$$

8) If $\sin\theta + \cos\theta = \sqrt{3}$. then find the value of $\sin\theta \cdot \cos\theta$

9) $(\sec^2\theta - 1)(\operatorname{cosec}^2\theta - 1)$ is equal to :-

10) The value θ for which $2\sin 2\theta = 1$, is

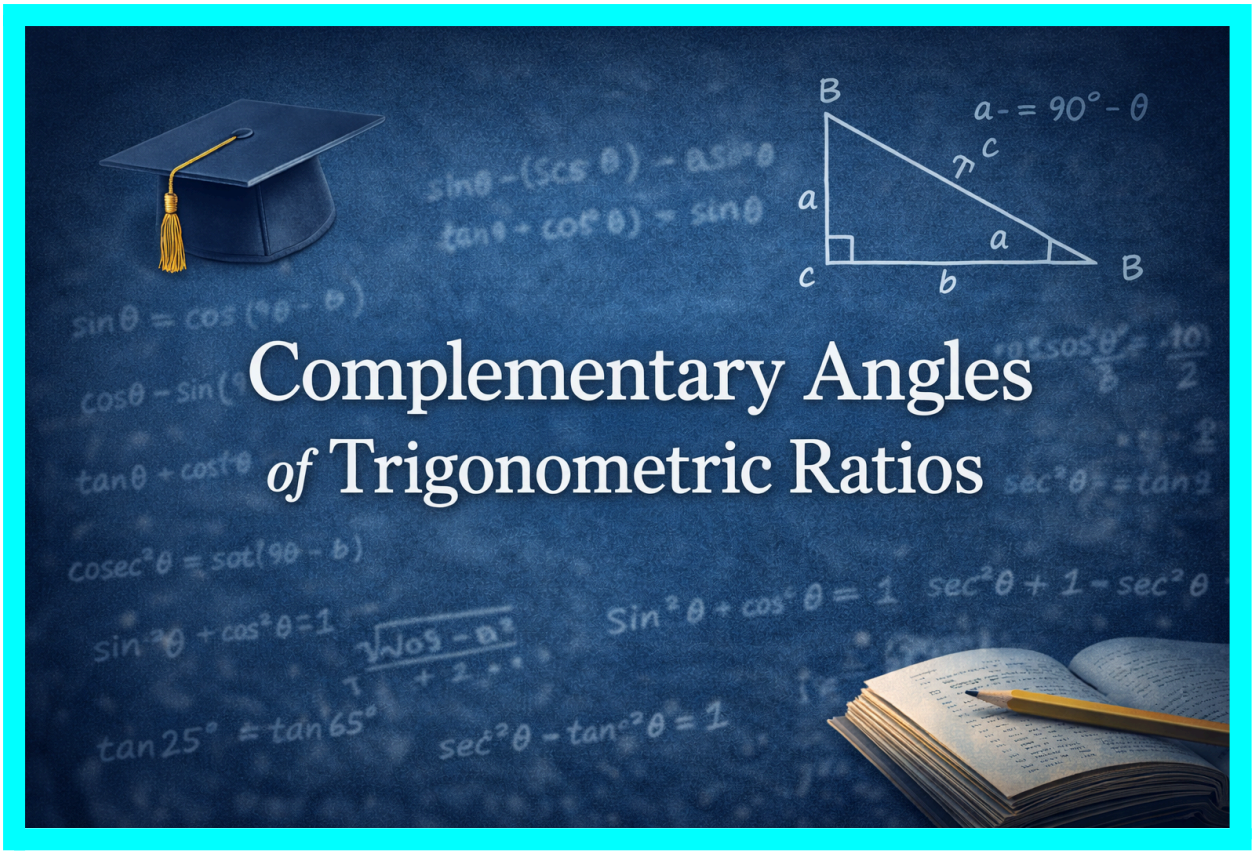
11) $\sin\theta + \sin^2\theta = 1$, find value of $\cos^2\theta + \cos^4\theta$ is

12) show that :- $\dfrac{1+\cot^2\theta}{1+\tan^2\theta} = \cot^2\theta$

13) The distance between the points $(a\cos\theta + b\sin\theta, 0)$ and $(0, a\sin\theta - b\cos\theta)$ is

14) prove that :-
$2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = 0$

15) If $\operatorname{cosec}^2\theta\,(\cos\theta - 1)(1 + \cos\theta) = k$, then find the value of k


B
a = 90° − θ
c
a
a
c
b
B
Complementary Angles
of Trigonometric Ratios

Formula's :-

1)	$\sin(90^\circ - \theta) = \cos\theta$
2)	$\cos(90^\circ - \theta) = \sin\theta$
3)	$\tan(90^\circ - \theta) = \cot\theta$
4)	$\cot(90^\circ - \theta) = \tan\theta$
5)	$\operatorname{cosec}(90^\circ - \theta) = \sec\theta$
6)	$\sec(90^\circ - \theta) = \operatorname{cosec}\theta$

EXAMPLES:-

1) find $\frac{\tan 65^\circ}{\cot 25^\circ}$

A) $\frac{\tan 65^\circ}{\cot 25^\circ} \Rightarrow \frac{\tan(90^\circ - 25^\circ)}{\cot 25^\circ}$ $(\tan(90^\circ - A) = \cot A)$

$\Rightarrow \frac{\tan(90^\circ - 25^\circ)}{\cot 25^\circ} \Rightarrow \frac{\cot 25^\circ}{\cot 25^\circ} \Rightarrow (1)$

2) Simplify :-

$$\frac{\sin(90^\circ - \theta) + \sin\theta}{\sin\theta - \sin(90^\circ - \theta)} \times \frac{\cos(90^\circ - \theta) - \cos\theta}{\cos(90^\circ - \theta) + \cos\theta}$$

A) Since, $\sin(90^\circ - \theta) = \cos\theta$ and $\cos(90^\circ - \theta) = \sin\theta$

$$\Rightarrow \frac{\cos\theta + \sin\theta}{\sin\theta - \cos\theta} \times \frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta}$$

$\Rightarrow (1)$

3) Solve for θ : $\tan 47^\circ = \cot\theta$

A) $\tan 47^\circ = \cot\theta$

$\tan(90^\circ - 43^\circ) = \cot\theta$

$\cot 43^\circ = \cot\theta$, $\boxed{\theta = 43^\circ}$

EXERCISES :-

Easy :-

1) If $\sin(\theta + 20^\circ) = \cos 4\theta$, find θ

2) If, $A = 30^\circ$, $B = 60^\circ$ prove that
$\sin(A+B) = \sin A \cos B + \cos A \sin B$

3) $\sin(90^\circ - \theta)\cos(90^\circ - \theta) = \dfrac{\tan\theta}{1+\tan^2\theta}$ (prove)

Medium

1) Prove :-
$$\frac{\sin\theta}{\sin(90^\circ-\theta)} + \frac{\cos\theta}{\cos(90^\circ-\theta)} = \frac{1}{\sin\theta\cos\theta}$$

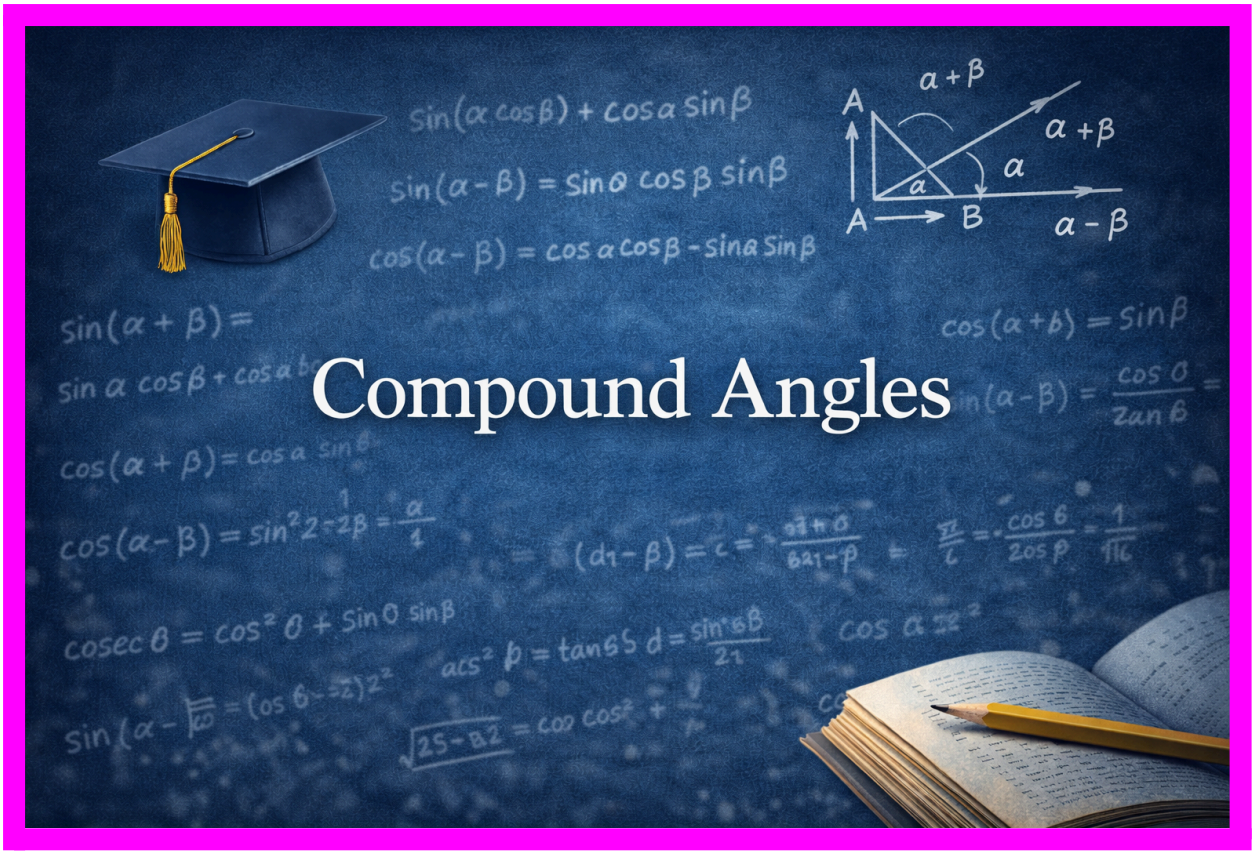
2) $$\frac{1}{1-\cos(90^\circ-\theta)} + \frac{1}{1+\cos(90^\circ-\theta)} = \frac{2}{\sin^2(90^\circ-\theta)}$$

Hard

1) In ΔABC, prove that $\sin\left(\frac{A+B}{2}\right) = \cos\frac{C}{2}$

2) value of $\tan 24^\circ \times \tan 48^\circ \times \tan 42^\circ \times \tan 66^\circ$

3) value of $\cot 10^\circ \times \cot 20^\circ \times \cot 60^\circ \times \cot 70^\circ \times \cot 80^\circ$


Compound Angles

Example :-

(1) find value of

a) $\sin 15^\circ$

$$\boxed{\sin(A-B) = \sin A \cos B - \cos A \sin B}$$

$$\sin(45^\circ - 30^\circ) = \sin 45^\circ \cos 30^\circ - \cos 45^\circ \sin 30^\circ$$

$$= \left(\frac{1}{\sqrt{2}}\right)\left(\frac{\sqrt{3}}{2}\right) - \left(\frac{1}{\sqrt{2}}\right)\left(\frac{1}{2}\right)$$

$$= \frac{\sqrt{3}}{2\sqrt{2}} - \frac{1}{2\sqrt{2}} \Rightarrow \boxed{\frac{\sqrt{3}-1}{2\sqrt{2}}}$$

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b) $\cos 15^\circ$

$$\boxed{\cos(A-B) = \cos A \cos B + \sin A \sin B}$$

$$\cos(60^\circ - 45^\circ) = (\cos 60^\circ)(\cos 45^\circ) + (\sin 60^\circ)(\sin 45^\circ)$$

$$= \left(\frac{1}{2}\right)\left(\frac{1}{\sqrt{2}}\right) + \left(\frac{\sqrt{3}}{2}\right)\left(\frac{1}{\sqrt{2}}\right)$$

$$= \frac{1}{2\sqrt{2}} + \frac{\sqrt{3}}{2\sqrt{2}}$$

$$= \boxed{\frac{1+\sqrt{3}}{2\sqrt{2}}}$$

(11) prove that

$\cos 70^\circ \cos 10^\circ + \sin 70^\circ \sin 10^\circ = \frac{1}{2}$

$= \cos(A-B) = \cos A \cos B + \sin A \sin B$

$= \cos(70^\circ - 10^\circ)$

$= \cos 60^\circ = \frac{1}{2}$, Hence proved

(iii) $\sin^2 52\frac{1}{2}^\circ - \sin^2 22\frac{1}{2}^\circ =$ [given $\sin 75^\circ = \frac{\sqrt{3}+1}{2\sqrt{2}}$]

A) $\boxed{\sin^2 A - \sin^2 B = \sin(A+B)\sin(A-B)}$

$= \sin\left(52\frac{1}{2}^\circ + 22\frac{1}{2}^\circ\right) \sin\left(52\frac{1}{2}^\circ - 22\frac{1}{2}^\circ\right)$

$= \sin(75^\circ)\sin(30^\circ)$

$= \left(\frac{\sqrt{3}+1}{2\sqrt{2}}\right)\left(\frac{1}{2}\right)$

$= \boxed{\frac{\sqrt{3}+1}{4\sqrt{2}}}$

(iv) $\cos 105^\circ \longrightarrow \cos(60^\circ + 45^\circ)$

(A) $\boxed{\cos(A+B) = \cos A \cos B - \sin A \sin B}$

$= \cos(60^\circ+45^\circ) = \cos 60^\circ \cos 45^\circ - \sin 60^\circ \sin 45^\circ$

$= \left(\frac{1}{2}\right)\left(\frac{1}{\sqrt{2}}\right) - \left(\frac{\sqrt{3}}{2}\right)\left(\frac{1}{\sqrt{2}}\right)$

$= \frac{1}{2\sqrt{2}} - \frac{\sqrt{3}}{2\sqrt{2}}$

$= \boxed{\frac{1-\sqrt{3}}{2\sqrt{2}}}$

Sums :-

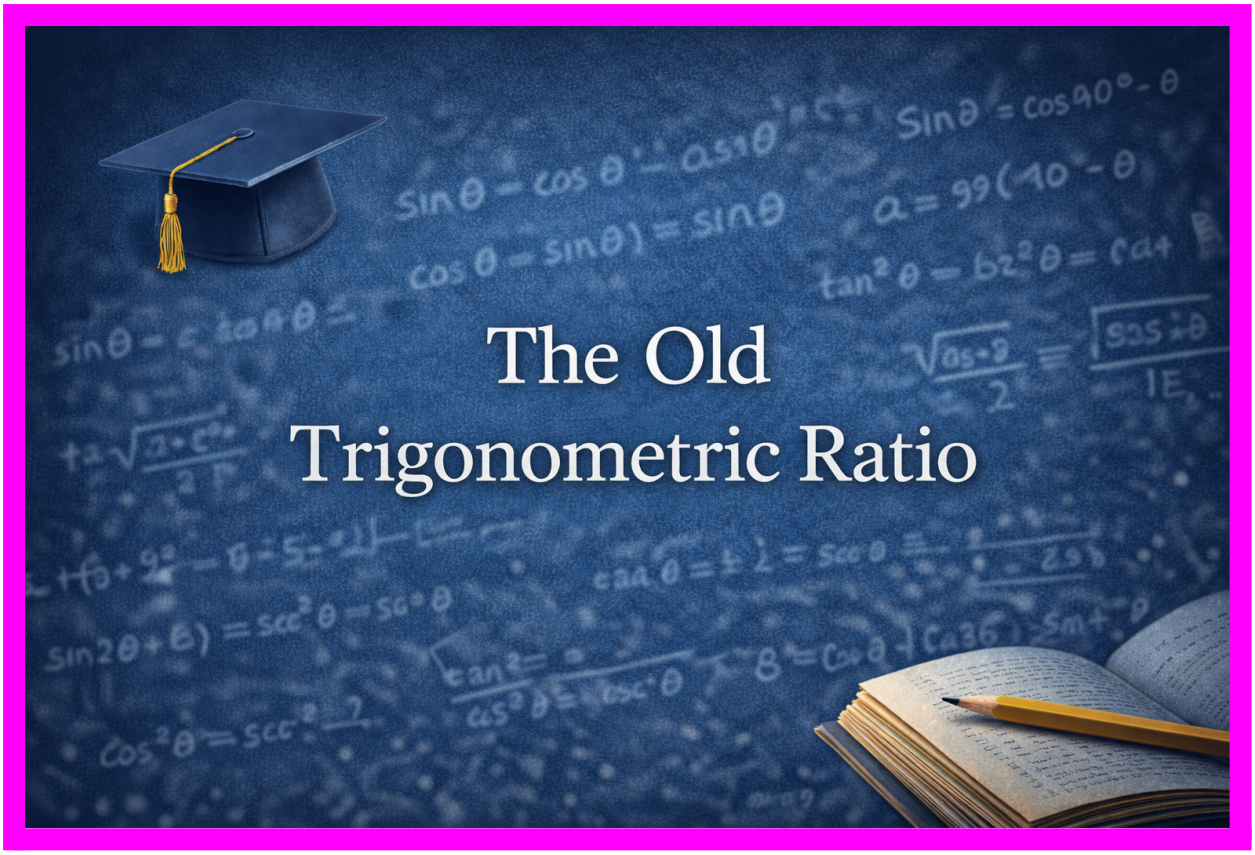
1) find $\tan 105^\circ$

2) find $\sin 75^\circ$

3) find $\cos 75^\circ$

4) prove :- $\sin(A+B)\sin(A-B) = \sin^2 A - \sin^2 B$

5) prove :- $\dfrac{(\tan A + \sec A - 1)\cos A}{\sin A + \cos A - 1} = \dfrac{1+\sin A}{\cos A}$



Versine Trigonometric Ratio

The versine of an angle is a trigonometric function defined as the difference between 1 and the cosine of the angle.

It is written as: $\text{versin}\,\theta = 1 - \cos\theta$

The versine function is mainly used in geometry, astronomy, and engineering to simplify certain calculations involving angles and circular arcs.

Though it is not commonly used in school-level problem solving, it helps in understanding advanced trigonometric concepts.